UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/078,601	02/19/2002	Xiaoming Ren	107044-0013	5541

24267 7590 01/25/2005

CESARI AND MCKENNA, LLP
88 BLACK FALCON AVENUE
BOSTON, MA 02210

EXAMINER	
ALEJANDRO, RAYMOND	

ART UNIT	PAPER NUMBER
1745	

DATE MAILED: 01/25/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/078,601	REN ET AL.	
	Examiner	Art Unit	
	Raymond Alejandro	1745	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *01 September 2004*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *37-102* is/are pending in the application.

4a) Of the above claim(s) *47-54,59-61,64,67,74-95 and 100* is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *37-46,55-58,62,63,65,66,68-73,96-99,101 and 102* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☒ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *01 September 2004* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date *10/20/04 and 12/02*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Continued Examination Under 37 CFR 1.114

A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on 09/01/04 has been entered.

This submission is being provided in response to the foregoing RCE and its related amendment. The applicants have overcome most of the objection and the 35 USC 112 rejection. Refer to the abovementioned amendment for specific details on applicant's rebuttal arguments. However, the present claims (including newly added claims 96-99 and 101-102) are rejected again over the same art as set forth above and for the reasons of record:

Election/Restrictions

1. Newly submitted claims 85-95 and 100 are directed to an invention that is independent or distinct from the invention originally claimed for the following reasons: claims 85-95 and 100 are directed to methods of operating fuel cells (method of delivering fuel to direct oxidation fuel cells themselves) which are also directed to a non-elected invention as set forth in the Restriction Requirement of 10/24/03 and the response to the Restriction Requirement of 12/18/03. Accordingly, such restriction requirement is equally applicable to claims 85-95 and 100, and thus, they will be withdrawn from further consideration.

Since applicant has received an action on the merits for the originally presented invention, this invention has been constructively elected by original presentation for prosecution on the merits. Accordingly, claims 85-95 and 100 are withdrawn from consideration as being directed to a non-elected invention. See 37 CFR 1.142(b) and MPEP § 821.03.

2. This application contains claims 47-54, 59-61, 64, 67, 74-95 and 100 drawn to an invention nonelected without traverse in Paper No. 12/18/03. A complete reply to this rejection must include cancelation of nonelected claims or other appropriate action.

Information Disclosure Statement

3. The information disclosure statement (IDS) submitted on 10/20/04 and 12/02/04 was considered by the examiner.

Drawings

4. The officially corrected drawings were received on 09/01/04. These drawings are acceptable.

Specification

5. The amendment filed 09/01/04 is objected to under 35 U.S.C. 132 because it introduces new matter into the disclosure. 35 U.S.C. 132 states that no amendment shall introduce new matter into the disclosure of the invention. The added material which is not supported by the original disclosure is as follows: (claims 37 and 45) "at least one *open* gaseous effluent release port...". In this regard, it is noted that the term "*open*" per se is unsupported by the original disclosure. Applicants have referred to page 14 of the Specification and Figure 6A as providing

support for such language. In addition, applicants have also argued that the term "*open means capable of allowing gas, but not liquid, to escape from the anode chamber*" (see the amendment of 09/01/04 at page 18, 2nd full paragraph) as a supplementary attempt to provide a particular definition thereof. Nevertheless, nowhere in the specification at page 14 and Figure 6A the examiner can first find support for the term "open" and, secondly, for its definition (***emphasis added***) as currently argued by the applicants. Thus, the term "open" and its particularized definition are not supported by the original specification. Applicant is encouraged to further define the claimed invention by employing the language or description as set forth in the original disclosure so as to better reflect the intended invention.

Applicant is required to cancel the new matter in the reply to this Office Action.

Claim Rejections - 35 USC § 112

6. The following is a quotation of the first paragraph of 35 U.S.C. 112:

> The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

7. Claims 37-43 and 45 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention. The added material which is not supported by the original disclosure is as follows: (claims 37 and 45) "at least one *open* gaseous effluent release port...". In this regard, it is noted that the term "*open*" per se is unsupported by the original disclosure. Applicants have

referred to page 14 of the Specification and Figure 6A as providing support for such language. In addition, applicants have also argued that the term "*open means capable of allowing gas, but not liquid, to escape from the anode chamber*" (see the amendment of 09/01/04 at page 18, 2nd full paragraph) as a supplementary attempt to provide a particular definition thereof. Nevertheless, nowhere in the specification at page 14 and Figure 6A the examiner can first find support for the term "open" and, secondly, for its definition (***emphasis added***) as currently argued by the applicants. Thus, the term "open" and its particularized definition are not supported by the original specification. Applicant is encouraged to further define the claimed invention by employing the language or description as set forth in the original disclosure so as to better reflect the intended invention.

Claim Rejections - 35 USC § 102

8. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

9. Claims 37-46, 55-58, 62, 63, 65, 66, 68-73, 96-99 and 101-102 are rejected under 35 U.S.C. 102(e) as being anticipated by Corey et al 2002/0172851.

The present claims are drawn to a direct oxidation fuel cell wherein the claimed inventive concept comprises the specific anode chamber configuration and gas effluent release port.

With respect to claim 37, 44-46, 55-56, 62-63, 96-99 and 101-102:

Corey et al disclose a direct oxidation fuel cell system 20 (DMFC) including a membrane electrolyte assembly 22 having a proton-conducting, electronically non-conductive membrane electrolyte 26 disposed between an anode chamber 22 and a cathode chamber 24 (SECTION 0039). Each surface of the membrane electrolyte 26 is coated with electrocatalysts which serve as anode reactive sites 23 on the anode chamber side of the membrane and cathode reactive sites 25 on the cathode chamber side of the membrane, thereby, facilitating the electrochemical reactions of the DMFC (SECTION 0039). *It is noted that the membrane electrolyte 26 may act as the specific gas-permeable, liquid impermeable layer coupled to the anode diffusion layer.*

Diffusion layers 27 and 28 may be included and positioned on either side of the membrane and provide a uniform effective supply of methanol solution to the anode reactive sites (SECTION 0041). It is disclosed that fuel cells generate electricity through electrochemical reactions (SECTION 0004) and they have a circuit connecting the anode chamber and the cathode chamber through an external electrical load (SECTION 0009 & 0043). Corey et al also disclose that the effluents could be removed by venting the carbon dioxide out of the anode chamber (SECTION 0014). *Thus, Corey et al clearly envisage having the gaseous effluent generated in the anode portion of the fuel cell vented out of the anode portion and into the surrounding atmosphere.*

Corey et al further disclose, *in particular*: that the effluents could be removed by venting the carbon dioxide out of the anode chamber (SECTION 0014); as well as an effluent gas produced in an anode chamber of a fuel cell is collector and then exhausted through a cathode chamber of the fuel cell (SECTION 0020); having the carbon dioxide produced from the oxidation of fuels not directly exhausted from the fuel cell system but, instead, used to

remove/recirculate effluent water in the cathode (SECTION 0017); and the fuel cell including a proton conducting membrane electrolyte separating the chambers and having an effluent gas-permeable portion allowing effluent gas produced in said anode chamber to flow into the cathode chamber (SECTION 0026). *Thus, Corey et al clearly envisage having the gaseous effluent generated in the anode portion of the fuel cell vented out of the anode portion and into the surrounding atmosphere.*

Figure 5 below depicts a passive control system using gas produced in the anode chamber for removing water from the reactive sites in the cathode chamber (SECTION 0085) wherein the CO2 is vented out or released to the ambient environment (FIGURE 5).

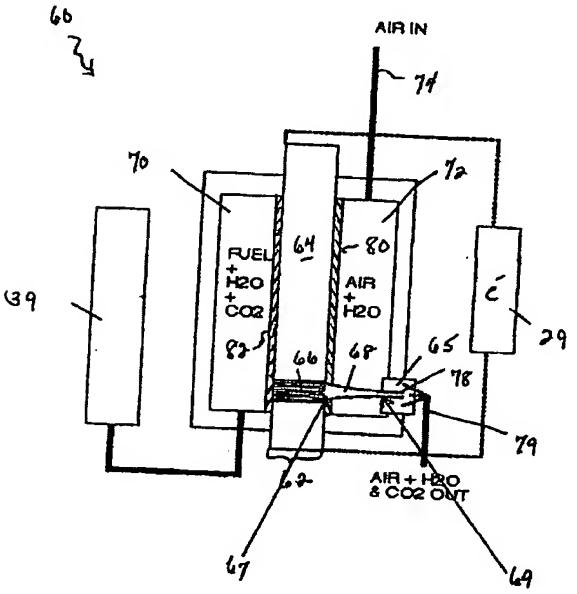

FIG. 5

As apparent from Figure 5 and Corey et al's disclosure of SECTIONS 0014, 0017 and 0020), this fuel cell system: i) can be provided with a gaseous effluent port located in the anode chamber in close proximity to the anode side of the membrane electrolyte; and ii) does not have any liquid exit port in the anode chamber per se. Thus, it has a liquid closed volume anode

chamber, and no anode liquid recirculation. These features act as a gaseous anodic product removal component. This structure also encompasses the absence of any water external pumping and/or active water removal element.

As previously mentioned, the fuel cell system of **Figure 5** above represents a *passive* fuel cell system (SECTION 0085). *Thus, it operates without external pumping of cathodically-generated water and without active water removal elements.*

With respect to claims 38-39, 57-58, 68-71, 96-99 and 101-102:

Corey et al teach the use of methanol (SECTIONS 0007, 0009, 0011) as well as the addition of another liquid such as water (SECTION 0009, 0041, 0043 & FIGURE 5). It is also disclosed that in a DMFC system, an aqueous methanol solution, preferably a solution greater than 0 to about 100 % methanol by volume can be used (SECTION 0043). *Hence, Corey et al at once envisage the use of: a) aqueous methanol solutions, b) 100 % methanol by volume per se and 3) aqueous methanol solution wherein the concentration of methanol is greater than 50 % by volume.*

With respect to claim 38 and 40:

As apparent from Figure 5 and Corey et al's disclosure of SECTIONS 0014, 0017 and 0020 and 0026, this fuel cell system: i) can be provided with a gaseous effluent port located in the anode chamber in close proximity to the anode side of the membrane electrolyte; and ii) does not have any liquid exit port in the anode chamber per se. Thus, it does have a liquid closed volume anode chamber, and no anode liquid recirculation.

With respect to claims 41 and 43:

Corey et al disclose that the carbon dioxide produced from the oxidation of fuels is not directly exhausted from the fuel cell system but, instead, used to remove/recirculate effluent water in the cathode (SECTION 0017); and the fuel cell including a proton conducting membrane electrolyte separating the chambers and having an effluent gas-permeable portion allowing effluent gas produced in said anode chamber to flow into the cathode chamber (SECTION 0026). *Thus, this implies that the water produced at the cathode is not collected or redirected to the anode, in fact, the anode effluent is being employed to remove such water out of the fuel cell system. Thus, a portion of the anode chamber is gas permeable.*

With respect to claims 42-43:

Corey et al further disclose that the effluents could be removed by venting the carbon dioxide out of the anode chamber (SECTION 0014);

With respect to claim 65:

Reference numeral 39 is a fuel supply cartridge and represents the external fuel source (SECTION 0080).

With respect to claims 66 and 72-73:

It is disclosed the establishment of low pressure regions adjacent the outlet in the anode chamber (SECTION 0026, 0088). *Thus, a pressure differential does exist between the fuel in the fuel source and the anode chamber. Accordingly, it is noted that this pressure differential effectively creates suction conditions in the anode chamber.*

Thus, the claims are still anticipated.

Response to Arguments

10. Applicant's arguments filed 09/01/04 have been fully considered but they are still unpersuasive.

11. All over again, throughout the entire remark section of the aforementioned amendment, the applicants have strenuously contended that the prior art of record does not teach the following: *a) "having a dead-ended anode chamber that does not require a recirculation loop"; b) "to manage the release of carbon dioxide"; c) "a closed volume dead-ended anode chamber that does not require pumps and a re-circulation loops"; d) "The release of carbon dioxide is discussed as one of the objects of the invention"; e) "the carbon dioxide is vented out of the system without having to circulate the fuel solution in which carbon dioxide is contained"; f) "passive selective venting of carbon dioxide"; g) "that carbon dioxide is effectively released from the gaseous effluent release port"; h) "venting or release of carbon dioxide directly from the anode aspect of the fuel cell to the ambient environment"; i) "the carbon dioxide is released to the environment through the gaseous effluent release port....and away from the membrane electrode assembly"; j) "These gas permeable portions allow gaseous carbon dioxide to be removed from the fuel cell"; k) "allow the carbon dioxide to escape directly to the ambient environment from the anode chamber"; l) "the importance of removal of carbon dioxide"* and the like. Yet again, the examiner points out that the present claim language is not commensurate in scope with applicants' arguments. That is to say, the present claims are completely silent as to: i) venting/releasing CO_2 generated in the anodic reaction out of the anode chamber. Nowhere in the present claims the examiner can find that CO_2 is released from or vented out of the anode chamber and its implication of assisting in efficient fuel management or delivery, avoiding the

need for pumping/valving the CO_2 or the need to recirculate unreacted fuel back into the fuel cell and the like.

12. Moreover, the examiner recognizes that the applicant is entitled to claim the intended invention as broad as possible but then, at the same time, the examiner is entitled to give the claim language its broadest reasonable interpretation. Having said that, the examiner wishes to indicate that the present claim language simply recites: a) "(claim 37) *at least one open gaseous effluent release port which is in substantially direct gaseous communication with the ambient environment allowing effective release of anodically-generated gaseous effluent from said fuel cell as said gaseous effluent is generated*"; b) "(claim 44) *a gaseous anodic product removal component disposed between said catalyzed membrane electrolyte and at least a portion of the interior wall of the anode chamber for effective release of anodically-generated gaseous effluent directly to the ambient environment*"; c) "(claim 45) *at least one open gaseous effluent release port located in said anode chamber in close proximity to said anode aspect of the catalyzed membrane electrolyte which is in substantially direct gaseous communication with the ambient environment and through which anodically generated gaseous effluent is allowed to be released from said fuel cell housing*"; d) "(claim 46) *means for outporting gasses away from the anode aspect of the fuel cell substantially directly to the ambient environment which means for outporting gasses is disposed in close proximity to said anode aspect of the catalyzed membrane electrolyte assembly*"; e) "(claim 55) *a gas-permeable, liquid-impermeable layer for releasing gaseous anodic product coupled in proximity to said anode diffusion layer*"; f) "(claim 56) *a gas-permeable, liquid-impermeable layer for releasing gaseous anodic product coupled in proximity to said anode diffusion layer*"; g) "(claim 62) *an element disposed between said fuel*

source and said anode aspect of the direct oxidation fuel cell for controlling the delivery of fuel to the anode aspect of the membrane electrolyte". In view of that and given that the prior art of record clearly teaches: that the effluents could be removed by venting the carbon dioxide out of the anode chamber (Corey et al SECTION 0014); as well as an effluent gas produced in an anode chamber of a fuel cell is collector and then exhausted through a cathode chamber of the fuel cell (Corey et al SECTION 0020); having the carbon dioxide produced from the oxidation of fuels not directly exhausted from the fuel cell system but, instead, used to remove/recirculate effluent water in the cathode (Corey et al SECTION 0017); and the fuel cell including a proton conducting membrane electrolyte separating the chambers and having an effluent gas-permeable portion allowing effluent gas produced in said anode chamber to flow into the cathode chamber (Corey et al SECTION 0026); in addition, Figure 5 clearly illustrates the CO2 being vented out or released to the ambient environment:

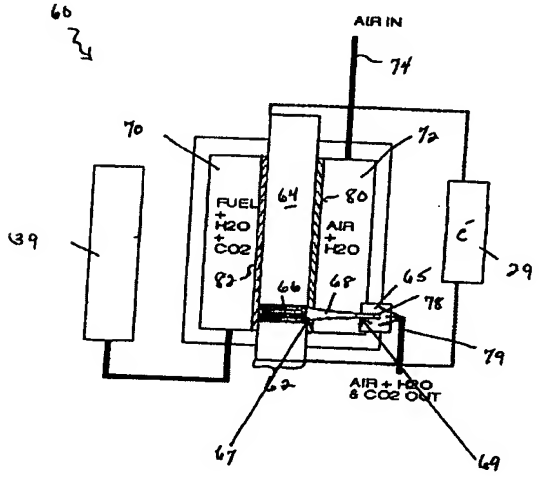

FIG. 5

thus, Corey et al clearly envisage having the gaseous effluent generated in the anode portion of the fuel cell vented out of the anode portion and into the surrounding ambient atmosphere; and having a delivery element for feeding fuel into the anode aspect of the membrane electrolyte. As

apparent from Figure 5 and Corey et al's disclosure of SECTIONS 0014, 0017 and 0020), this fuel cell system: i) can be provided with a gaseous effluent port located in the anode chamber in close proximity to the anode side of the membrane electrolyte; and ii) does not have any liquid exit port in the anode chamber per se. Thus, it has a liquid closed volume anode chamber, and no anode liquid recirculation. These features act as a gaseous anodic product removal component. This structure also encompasses the absence of any water external pumping and/or active water removal element. Hence, it is emphatically asserted that the prior art of record still provides both the necessary functional and structural interrelationship to satisfy the claimed requirement.

13. Furthermore, the fact that the claim language recites that "*anodically-generated gaseous effluent*" or "*gases*" or "*gaseous anodic product*" does not mean that such gaseous effluent is only CO_2. It broadly refers to any gaseous product. Additionally, the claim language "*the effluent release port is in substantially direct gaseous communication with the ambient environment*" does not necessarily imply that gas venting or releasing cannot occur through the electrolyte membrane and subsequently through the cathode (which is also in close proximity thereto) as disclosed by Corey et al. That is to say, the claim language just requires releasing any gaseous product effluent from the fuel cell or the anode chamber but it does not positively set forth that gas cannot be released through the electrolyte membrane and cathode as disclosed in the prior art. It just implies that the fuel cell structure is able to release gaseous effluent no matter how the gaseous effluent is released therefrom. That's why it is believed that the prior art of record still provides the necessary functional relationship of effectively releasing anodically-generated gaseous effluent.

14. Now, with respect to the specific assertion that the prior art does not disclose venting CO_2 out of the anode chamber, the examiner wishes to contend that the prior art clearly discloses that the effluents could be removed by venting the carbon dioxide out of the anode chamber (Refer to Corey et al, SECTION 0014 and Figure 5) (*and as admitted by the applicants, see the amendment of 09/01/04, at page 18, 1st full paragraph and paragraph bridging pages 18-19*). Thus, Corey et al clearly envisage and directly teach having the gaseous effluent generated in the anode portion of the fuel cell vented out of the anode portion and into the surrounding atmosphere through the cathode chamber. Thus, this assertion is not well-placed as the prior art clearly teaches venting the generated CO_2 gas. In view of the broad claim language, it is still not understood why applicants have taken the position of contending that the prior art fails to disclose the foregoing limitations when in fact and without a reasonably doubt the prior art teaches to do so.

15. As to the allegation that "Applicant's invention is a simplified system that promotes fuel efficiency by venting CO2 substantially directly to the ambient environment, and not through the cathode chamber, and it does not include fluidic communication for delivering anodically-generated CO2 from the anode chamber to the cathode chamber" (refers to remarks of the amendment of 09/01/04), again, it is noted that the claim language does not set forth or, at least suggest, the necessary functional and structural interrelationship to satisfy the requirement argued by the applicants. Thus, the above-mentioned features upon which applicant relies are not recited in the rejected claims. Although the claims are interpreted in light of the specification, limitations from the specification are not read into the claims. See In re Van Geuns, 988 F.2d 1181, 26 USPQ2d 1057 (Fed. Cir. 1993). In addition, it is further pointed out

the present claim language also reads on having the generated CO_2 vented out of the anode chamber through the cathode chamber as no CO_2 gas fluid restriction has been indicated in the present claims.

16. In response to applicant's argument that: a) "*Corey, in the ordinary course of fuel cell operation, directs anodically generated carbon dioxide through a feature in a modified cell membrane and through the cathode chamber*"; b) "*using an unmodified membrane electrolyte would not be an effective way to encourage or manage release of the carbon dioxide out of the cell*"; c) "*the Corey system manages carbon dioxide by routing it through a feature in a modified membrane electrolyte and next through the cathode chamber targeting removal of excess water in the cathode chamber of the fuel cell.....this approach requires a specialized modification of the cell membrane electrolyte or addition of a feature to the membrane electrolyte assembly...*", the fact that applicant has recognized another advantage/disadvantage which would flow naturally from following the suggestion of the prior art cannot be the basis for patentability when the differences would otherwise be obvious. See Ex parte Obiaya, 227 USPQ 58, 60 (Bd. Pat. App. & Inter. 1985).

17. Regarding the requirement of having "a gas permeable, liquid impermeable layer coupled to the anode diffusion layer", the examiner also likes to state that the membrane electrolyte 26 per se may act as the specific gas-permeable, liquid impermeable layer coupled to the anode diffusion layer as Corey et al (*and as admitted by the applicants*) address the issue of allowing the passage of CO_2 from the anode chamber to the cathode chamber which are physically separated from one another by the membrane electrolyte 26. Consequently, the membrane electrolyte 26 exhibits gas permeability characteristics. Absent any further specific structural

relationship between the anode layer and the gas-permeable liquid-impermeable layer (*e.g. specific placement, positioning, etc*), the examiner respectfully submits that the membrane electrolyte 26 does meet the requisite of the claimed limitation.

18. Applicants have further contended that the language "*open*" (which is also unsupported by the original disclosure) means capable of allowing gas, but not liquid, to escape from the anode chamber (see the amendment of 09/01/04 at page 18, 2nd full paragraph). Nevertheless, no support for the particularized definition of the term "open" has been found throughout the original disclosure, in particular, at page 14 and Figure 6A. However, in order to address such limitation, it is contended that the electrolyte membrane of the prior art which allows carbon dioxide to pass from the anode aspect of the fuel cell to the cathode chamber meets the requirement of being an open gaseous effluent release port. Moreover, applicants have also contended that "*the membrane electrolyte is not sufficiently permeable to carbon dioxide to allow for effective removal (or effective release) of the carbon dioxide product from the anode chamber*". In this respect, since the term "effective removal" or "effective release" is not defined in term of a specific flow rate or a quantitative mass measurement so as to ascertain the required degree of fluid removal, it is contended that the membrane electrolyte of the prior art is able to effectively remove gaseous effluent from the cathode aspect. To be precise, in the absence of a fairly-supported definition of what is meant by "effective removal" or what specific amount of gas or flow rate is intended by the term "effective removal", it is certainly asserted that the prior art's membrane electrolyte effectively removes anodically-generated gaseous effluent from the anode aspect.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Raymond Alejandro whose telephone number is (571) 272-1282. The examiner can normally be reached on Monday-Thursday (8:00 am - 6:30 pm).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Patrick J. Ryan can be reached on (571) 272-1292. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Raymond Alejandro
Examiner
Art Unit 1745